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Initial Trip of the North West.

Notwithstanding circumstances combined to delay the North West on her first trip between Buffalo and Duluth, there is no doubt but that she can make her schedule time without difficulty. An unofficial log of the first trip will be interesting to those who are watching the performance of this passenger express craft. She left Buffalo, Tuesday June 5, 9:30 p. m., eastern time, arriving in Cleveland 6 a. m. On this run the steamer logged as high as twenty miles an hour. She left Cleveland about 8 a. m., arriving in Detroit at 3 o'clock, leaving a half hour later. When she came into the Hay lake channel she was on time, but lost an hour in checking down going through the rock cut. This hour was the cause of several hours delay caused by the other vessels reaching the lock ahead of the North West. About six hours delay ensued and it was 6:30 p. m. Thursday when the white steamer got away towards Lake Superior. Her schedule time from the Sault to Duluth is 20 hours and she made it 21½ hours, arriving at Duluth at 2:30 p. m., Friday, the afternoon being given up to a half-holiday. Residences were decorated and parties of from 200 to 300 had come by special train from Minneapolis and St. Paul. An excursion was given during the afternoon, the boat being inspected by Prest. James J. Hill of the Great Northern Railway, principal owner of the boat. All night was consumed in getting fuel, which will not be necessary in future trips, so it was 5:30 a. m., Saturday, when the North West left the head of the lakes. This was unfortunate as nothing was to be gained by reaching the Sault before daylight, and when it was found that an ordinary speed was going to bring that result, she was checked down at Whitefish point, arriving at the Sault at 5:30 a. m., Sunday. From the Sault to Detroit she made schedule time, but from Detroit to Cleveland and on the way to Buffalo, several boilers were shut off on account of the coal having been placed mostly in the forward bunkers at Duluth, and it was found that it could not be passed to advantage.

The inauguration of such service entails a vast amount of detail, and that the North West was ready to start on her second trip only 45 minutes late, 30 of which were made up before reaching Cleveland, shows that the Northern Steamship Company's managers knew what they were about when they said they could run a passenger steamer on schedule time at passenger train speed. Passengers state that the service is the best afforded, and the cuisine is all that could be desired. The passenger list on the second trip showed an encouraging increase and it will only require a season of hot weather to demonstrate that the enterprise of the company in giving the lakes the finest exclusive passenger steamer in the world, will be productive of something more substantial than honor and glory. It is understood that the engines developed over 6,000 horse power, as shown by some tests made during the trip. This was while the engines were running from 100 to 110 revolutions.

The Freight Situation.

So much attention has been attached in connection with lake freight matters, to the settlement of the coal strike that a dispatch from Ironwood stating that the iron miners had demanded an increase of from 25 to 50 cents per day, attracted little attention. It is quite probable, however, that a general strike among miners in the Lake Superior region will be inaugurated soon. This is something that brokers have not taken into consideration, but the heavy shipments of iron ore, as shown by the Sault canal reports, would indicate that shippers have been aware of this and have accordingly taken more wild tonnage than they would have done under other circumstances. When the coal strike has been cleared up, as is now hoped for, their still remains the coke strike. Altogether the outlook is far from bright, and a prominent broker summed it up by saying that the situation has been better, even this year.

There is a little doubt but that the present rates on ore, Escanaba 50 cents, Marquette 65 and head of Lake Superior 80 cents, will hold for some time to come, although there were some fears of the Escanaba rate breaking. The price of fuel at Lake Erie ports begins to settle as the demand begins to be supplied, but coal for shipment will not be a factor in lake freights for a week or ten days, though a few straggling cargoes may be secured. Brokers that are posted on the coal situation say that when coal does begin to arrive for shipment it will come very slowly. Fair quantities of fuel are attainable in Cleveland at \$3.25, and it will continue to arrive steadily from now on, although the situation along the C. L. & W. Ry., a chief line of supply, is improving.

The fact that even with the fuel supply limited the feeling among

brokers for maintainance of present rates is weak, bodes no good when fuel becomes plenty, and tonnage tied up for lack of it is put into the market, in addition to that which will fit out for the first time during the season, as soon as coal freights become profitable. The 45 cent rate on coal Buffalo to Chicago is endorsed by a few charters every day, and if the grain rate at Chicago had only held its own there might have been some encouragement in the situation. Had the coal strikers won a complete victory and gone to work simultaneously in all parts of the country, furnishing a good supply for shipment, the lake freight sick man could have been encouraged with promises of recovery, instead of a lingering illness as at present. Determination, however, sometimes keep very sick men from death's door.

Launch of the Superior 72 Years Ago.

Mr. G. W. Jones, the oldest lake ship builder that is still alive, presents an interesting account of the launch of the Superior, built the same year that the Walk-in-the-Water was lost. It was written by Wm. Hodge, who was present at the launch. Mr. Jones built the first vessel on Lake Superior, the John Jacob Astor, in 1835, for the American Fur Company. The material was gotten out at Lorain and hauled around the rapids at the Sault.

The account gives the dates of the launch, first trip and loss of the Walk-in-the-Water. Inaugural excursions were in vogue even in those days. On August 25, 1818, an excursion was given the citizens of Buffalo to Point Abino and return. The account continues as follows:

"The next boat built was in the village of Buffalo at the foot of Washington street, and was called the Superior. She was launched April 16, 1822. Before the launch a number of men were permitted to climb aboard. Many hundreds (I cannot say thousands as our whole town contained less than 2,000 inhabitants) were assembled to see her launched. When all things were ready word was given. Then commenced the rattling of the sledges of the ship carpenters who lay under the boat knocking out the blocks. Soon she started. All watched with breathless anxiety as the boat was sliding down the ways. Each one seemed to be holding his breath when, just at the right moment, a negro called Whistling Tom gave a shrill imitation of a bugle note. This seemed to electrify all present and then went up from the multitude (?) a shout that made the welkin ring. The next minute there were several skiffs manned and with pikes and boat hooks they were saving the floating timber that was carried into the water. In the midst of the confusion a cry came from the hull that needed attention. A man had got his leg broken. Doc. Congdon, who was quite a corpulent man, hustled around for some time, not having the agility to climb up from a skiff to get aboard. He finally succeeded, however. A broken leg was not a very common occurrence in our village. It was caused by the lurch of the boat when the keel struck the water. There were some greasy trousers that day among the boys, caused by climbing over the greasy ways.

"Among those from the country was a girl and boy. They were used to walking logs and did not hesitate to cross the ways. The girl fell down and was prevented from being launched by the timely assistance of the boy."

Speed and Cargo Records—Lake Freight Boats.

Iron ore: Maritana, Minnesota Steamship Company of Cleveland, 4,260 gross or 4,771 net tons, Escanaba to South Chicago; S. S. Curry, Hawgood & Avery Transit Company of Cleveland, 3,852 gross or 4,314 net tons, Escanaba to Fairport; Merida, Whitney Trans. Co. of Detroit, 3,320 gross tons, 3,718 net tons, Ashland to Lake Erie.

Grain: Selwyn Eddy, Eddy Transportation Company of Bay City, 130,820 bushels of wheat, Detroit to Buffalo; Centurion, Hopkins Transportation Company, St. Clair, Mich., 147,812 bushels of corn, Chicago to Erie; Onoko, Minch estate, Cleveland, 187,657 bushels of oats, Chicago to Buffalo.

Coal: E. C. Pope, Eddy Bros. of Bay City, 3,950 net tons anthracite Buffalo to Chicago.

Speed: Oswego, Union Line of Buffalo, Buffalo to Chicago, 889 miles, 54 hours and 16 minutes, 16.4 miles an hour.

Judge Nelson of St Paul gave judgment for \$2,000 to O. Enstrom, state grain inspector, who fell into the hold of the City of Naples. Defendants claim the inspector had no business aboard the vessel and that they are not liable for the mishap.

Attainments of the Lake Carriers' Association.

The following extract from a letter, written recently by Capt. Geo. P. McKay, treasurer of the Lake Carriers' Association to the president of one of the passenger steamship lines, is a short summary of the work of the association in legislative matters and will serve to show the advantages of the organization, aside from the main object attained in the conduct of shipping officers:

"I am informed by Mr. C. H. Keep, secretary of the Lake Carriers' Association, that your boats have not been listed in the organization for 1894, and our long association together in the past prompts me to write you on the subject. I know that if you were fully aware of the work the association is doing, even in legislative matters, you would feel it a duty to contribute your part toward support of the very good organization which we now have in hand. Just within the past few days we have succeeded, through sending a delegation to Washington, in getting assurance from the secretary of war that the bridge pier, against which your Chicago people have been fighting, will not be permitted to go in.

"This same committee, headed by our attorney, Harvey D. Gonlder, Esq., has been fighting also a clause in the immigration bill, that would send a vessel owner to penitentiary if a captain should hire a Canadian deck hand, fireman or sailor, who had not been six months in the country. By efforts of this association, mainly, a 40-cent duty was placed on iron ore by the senate, after the house had made it free. A short time ago you would have been compelled to equip your boats with guns and life lines but for a repeal of the law, which was only secured after long and expensive work on the part of our organization.

"These are only a few of the legislative matters that have demanded the attention of the association recently. The raft towing regulations in the river and harbor bill and the amendments to the Harter bill, which removed the features of that act unfavorable to the vessel interests, were also results of the influence of the association. Then, too, there is the bill which required all vessels to report to customs officers every time they entered or left port, no matter how unimportant the port might be, and which provided for a detailed statement of all cargo taken on or discharged. Such a measure would be especially disadvantageous to passenger boats, as Mr. Carter of Detroit, Mr. Goodrich and others informed us. We had a hard time defeating the bill, as it was intended through the reports to compile statistics of lake commerce, and we were actually compelled to oppose the heads of the treasury department in the matter. Of course you know we are continually at work on lights and other aids to navigation. The civil sundry appropriation bill, now in committee of the senate, provides funds for another light on Lake Superior, that will be especially advantageous to your boats. I earnestly hope you will have your ships enrolled in the association at once, as I can not see how you can afford to remain out with so many advantages resulting from united action."

Hay Lake Channel.

Although the passenger steamer North West, drawing nearly as much water as freight boats in the Lake Superior trade, made the passage of the new Hay lake channel without difficulty, and was followed by the steamer J. H. Wade, also bound up, the work of the contractors is not yet fully completed and will not be for a few weeks to come. It is hoped that the appropriation for lighting and buoying the channel will be available about June 30, so that this important part of the work may be hurried to completion. The channel will be marked throughout by buoys and floating lights, placed in pairs on both banks. A correspondent who was a passenger on the North West sends us the following account of the inaugural trip:

"On our passage up, shortly after turning the can buoy in Mud lake, we met the government steamer Myra. She came alongside of the North West, and we were soon joined by Assistant Engineer E. S. Wheeler, Lieut. Riche, U. S. A., in charge of the river survey, and the assistant engineers who have been connected with the Hay lake work. Engineer Joseph Ripley, who has been in charge of the details of the improvement of the Hay lake channel, including the original survey made for this purpose by Assistant Engineer Alfred Noble in 1879, took his station on the pilot house as principal pilot of the trip. He was watched by E. S. Wheeler and Capt. Ford Hursley. Upon approaching the rock cut at Middle Neebish, the steamer was checked down and came up through the channel with about as little trouble to the wheelsman as when running through Mud lake. After passing the Elbow at the head of Middle Neebish, the boat was opened out and the passage through Hay lake was made, and the approach through the cuts to the islands at little rapids was reached in so short a time that the passengers were hardly aware of their arrival at the artificial cut at the little rapids, before the boat was plowing her way through a 20-foot channel where about a year ago the trees were growing. As the North West came out of the new channel and entered the old steamer channel, just above Topsail islands, several of the fast barges, which had passed the Encampment about an hour ahead of the North West, were encountered, demonstrating very nicely the saving in time of

the Hay Lake channel over the old route. Upon arriving at the "Soo," Mr. Wheeler and party were allowed to land in safety, and the near completion and practical utility of the Hay Lake channel has been demonstrated."

More Trials with Belleville Boilers.

Results of some later trials of the British gunboat Sharpshooter, which is fitted with Belleville boilers, are reported in English exchanges. One of these was an eight-hours' natural draft trial, from which the following results are reported: Steam in boilers, 216; vacuum, starboard, 27.6 inches, port, 26.9; revolutions, starboard, 236.5, port, 239.5; I. H. P., 2,620; speed by log, 17 knots an hour. A few days later a forced draught trial was made and proved to be the most successful as regards speed and horse power which has yet been accomplished. The mean results of three-hours steaming were as follows: Steam in boilers 183, engine room, 143 pounds; vacuum, starboard, 26.1, port, 26.7; revolutions, starboard, 253.4, port, 256.1; I. H. P., 3,235; air pressure, .13 of an inch; speed by log 19 knots. The record of coal consumption was 2.04 pounds per hour for each I. H. P. It is reported that 3,500 H. P. could have been attained if the forced draught had been slightly increased; and as this can be easily effected by increasing the means of providing the draft it is possible that a still higher speed may be obtained if it is considered desirable. The Sharpshooter will be commissioned immediately, in order that the new Belleville boilers may have a thorough test under various conditions of service.

Great Activity in War Ship Construction.

A summary of war ship construction shows great activity in England. Nine huge battleships, of the largest type in the world, being of 14,900 tons displacement and 13,000 H.P., are now under construction or about to be laid down. To this list may be added the battleship Renown of 12,350 tons and 10,000 H. P., now in progress at Pembroke. Of the cruisers building, two, the Powerful and Terrible, far surpass in their class anything ever before designed. They are of 14,200 tons displacement each, or nearly double that of our great racers Columbia and Minneapolis, and are to exceed the latter in contract speed, having the enormous aggregate of 25,000 indicated horse power each. Then comes a class of cruisers of 5,600 tons displacement, or about like our Olympia, and with 9,600 H. P. The four great torpedo-boat destroyers, Havock, Hornet, Daring and Decoy, are only the pioneers of a great fleet of similar vessels. Then of gun vessels we find building at Devonport the Hussar of 1,070 tons and 3,500 horse power, and at Sheerness the Torch and Alert of 960 tons and 1,400 horse power. Some of the vessels here named may not yet be begun, but all are planned. Taken in conjunction with this array the explanation made the other day by the government that it does not wish to make known its full program of new construction, but only such an installment of it as must immediately be carried into effect, and it will be seen what Great Britain is doing to keep up her naval supremacy.

Number of Vessels and Tonnage of Ocean Liners.

For the purposes of comparison it may be noted that the number of vessels and gross tonnage of some of the principal foreign steamship lines are as follows:

	No. of vessels.	Gross tonnage.
Cunard	31	112,124
Campagnie General Transatlantique.....	66	172,423
Hamburg American.....	59	209,000
North German Lloyd.....	80	225,097

Providence Windlasses Abroad.

The Marine Journal says: "Forty-one vessels, mostly big ships, but some of them yachts, built in Great Britain, have been supplied with capstans or windlasses of American manufacture during the past two years. This showing of aggressiveness by an American manufacturer could not be made except upon the reliability and efficiency of the article produced. Especially in Great Britain, the boast of whose shipbuilders is that they lead the world, would it be impossible for any vessel appliance not of native production to obtain a foothold at all unless the shipbuilders were convinced that it was a little better than anything else that the market afforded. To have obtained such a notable and growing custom therefore, "in the teeth of the enemy," as it were, is a victory for the high standard qualities of this manufacture that can not be underestimated. It proves that in windlasses, capstans and similar productions, the American Ship Windlass Company of Providence, R. I., have an exceptionally high reputation, based upon solid merit."

The Journal also adds that Yacht Designer Watson, the eminent Scotch author of the lines of so many cup competitors and other famous racers, has been paying attention to American marine inventions and devices. Not a few Americanized improvements were noticeable on the Valkyrie, and now Mr. Watson has adopted the Providence capstan on some new yachts he is building on the Clyde.

Illustrated Patent Record.

SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

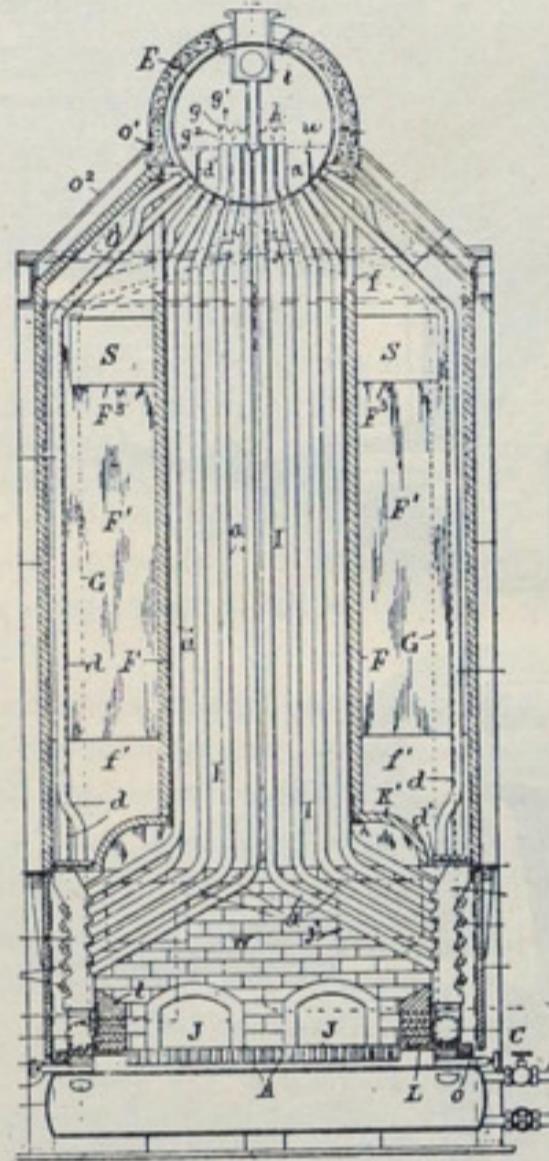
520,882. WATER TUBE BOILER. John J. Hogan, Brooklyn, N. Y. Filed May 13, 1892. Serial No. 432,855.

Claim: In a water tube boiler, the combination, with a steam drum sustained above a furnace, and a distributing drum arranged at one side of the fire box, of a series of headers projecting upward from such distributing drum a series of ascending water tubes projected from the face of each header inward over the fire and thence upward through the furnace into the bottom of the steam drum, a series of descending water tubes shielded from the furnace and connecting the side of the steam drum with the upper part of the header, and a partition extended downward within the header between the inlet of such descending tube and the lower ends of the ascending tubes.

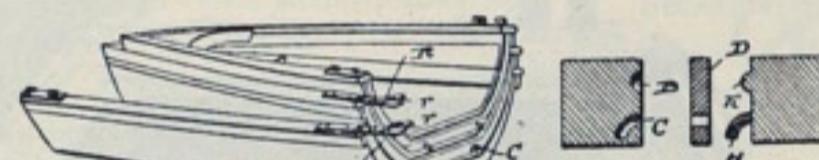
520,823 BOAT. Charles C. Heimbaugh, Momence, Ill. Filed August 21, 1893. Serial No. 483,667.

Claim: In a boat the combination of a middle section having a groove B and sockets C formed in one end and provided at its other end with a series of pins and a bead, W, a gasket attached to said section and extending across the groove in the end thereof, a bow section provided at its rear end, with a bead adapted to enter the groove in the adjacent end of the middle section, and pins or studs adapted to extend into the sockets

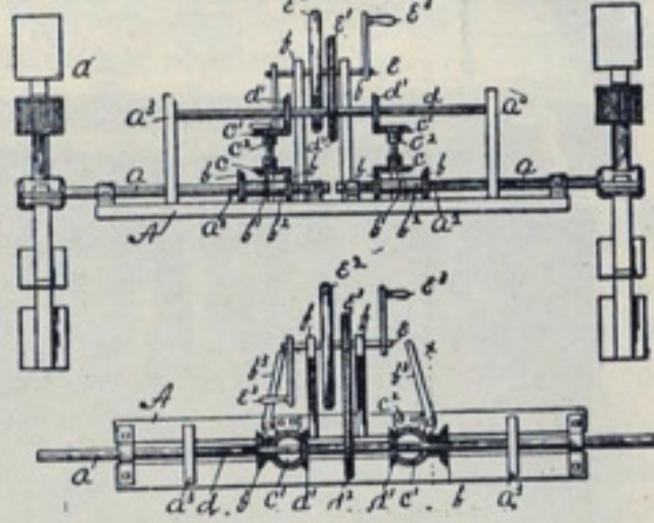
520,882. WATER-TUBE BOILER.



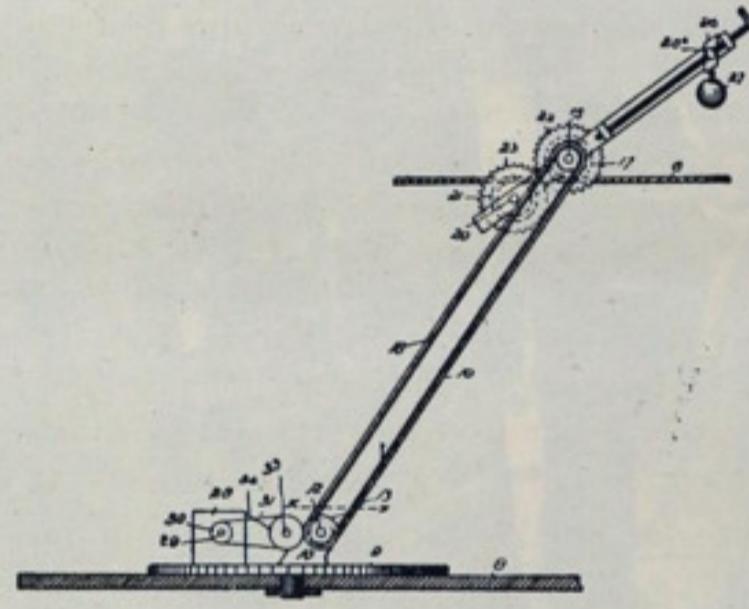
520,823. BOAT.



520,944. PADDLE-WHEEL MECHANISM



521,146. PROPELLING MECHANISM FOR CANAL-BOATS.



C in said middle section, a stern section provided at its forward end with a groove, adapted to receive the bead on the rear end of the middle section, and sockets adapted to receive the pins at the rear end of the middle section, and a gasket attached to the stern section and extending across the groove in the end thereof.

520,944. PADDLE-WHEEL MECHANISM FOR PROPELLING A BOAT. Joseph C. Thomas, New Bedford, Mass. Filed Jan. 22, 1894. Serial No. 497,616.

Claim: A boat propelling apparatus, mounted on a base, adapted to rest across the gunwales of a boat, and be removably secured thereto, consisting of the paddle wheels a' , mounted on independent shafts a ; the sleeves b^2 , one on each shaft, provided with bevel gears b , and adapted to be shifted longitudinally on said shafts, and to revolve therewith; the gears c , and c' , mounted on shafts, having their bearings in stands c^2 ; a shaft d , mounted in bearings, and bearing bevel gears d' , d'' , adapted to mesh with the gears c' , and provided with the chain or band wheel d'' ; a shaft e , mounted in bearings f , and provided with cranks e^3 , and a chain, or band wheel e' , connected with the wheel d'' on the shaft d , by a chain or band.

521,146. PROPELLING MECHANISM FOR CANAL BOAT. Henry W. Hildebrand, Denver, Colo. Filed December 11, 1893. Serial No. 493,302.

Claim: The combination with a boom attached to the boat, of a trolley carried by the boom and composed of a weighted lever, two shafts journaled in the lever and carrying pulleys adapted to engage a suitable fast cable, both above and below, fast gears mounted on the pulley shafts and adapted to mesh, and suitable means connected with the boom for transmitting motion from a prime motor on the boat to the trolley.

Financial Scheme of the New Canadian Line.

Papers in connection with the proposed fast Atlantic service were presented to the Canadian parliament today. They show that Mr. Huddart's proposal is to float a company with a capital of £2,000,000 sterling, which shall jointly operate the Atlantic and Pacific services. Four vessels of a tonnage of 8,000 to 10,000 tons are to be placed on the Atlantic with a speed of 20 knots an hour. Two new vessels are to be added to the Pacific service, the subsidy for which will remain at \$125,000. The Atlantic subsidy is to be \$750,000 yearly. If the scheme now proposed goes through, the Dominion government will agree to guarantee the interest on a debenture issue of £1,500,000 at 4 per cent. for 20 years, and to renew the contract at the end of ten years, both conditions being contingent on the service being satisfactory to the government. In reply to a query from Mr. Bowell, Mr. Huddart cabled that the proposed steamers for the Atlantic service, would have a cold storage capacity for 4,000 quarters of beef in chilled condition, equal to 1,000 head of cattle.

Presentation to the Chief of Transportation.

The association of American exhibitors of the World's Columbian exposition presented to Willard A. Smith, chief of the transportation department a handsome vase of Greek design at the Union League club, Chicago, last week. The vase stands 25 inches high, on an ebony pedestal. The chief feature is the reproduction of the golden door in relief. En-

circling the vase upon the upper hemisphere are eight medallions illustrating the development of marine transportation. The series relating to propulsion by oar begins with the primitive canoe of the aborigine. Next the canoe is the Venetian gondola, whose silhouette, picturesque in outline, recalls pleasant hours the beautiful lagoons and waterways of Jackson park. Adjoining the gondola is the Viking ship in which each oarsman is shown seated behind a shield, recalling early methods of warfare and the pre-columbian discoverers of America. Vessels with sails are represented by the Santa Maria; and the mind reverts to the models of the caravels, exact reproductions of the original ships and faithful in every detail of construction. A full rigged American sailing ship of the year 1800, the type around which cluster so many reminiscences of the beginning of American commerce and the early merchantmen and navy of the United States, during the era of wooden bottoms, finds a place next the Santa Maria.

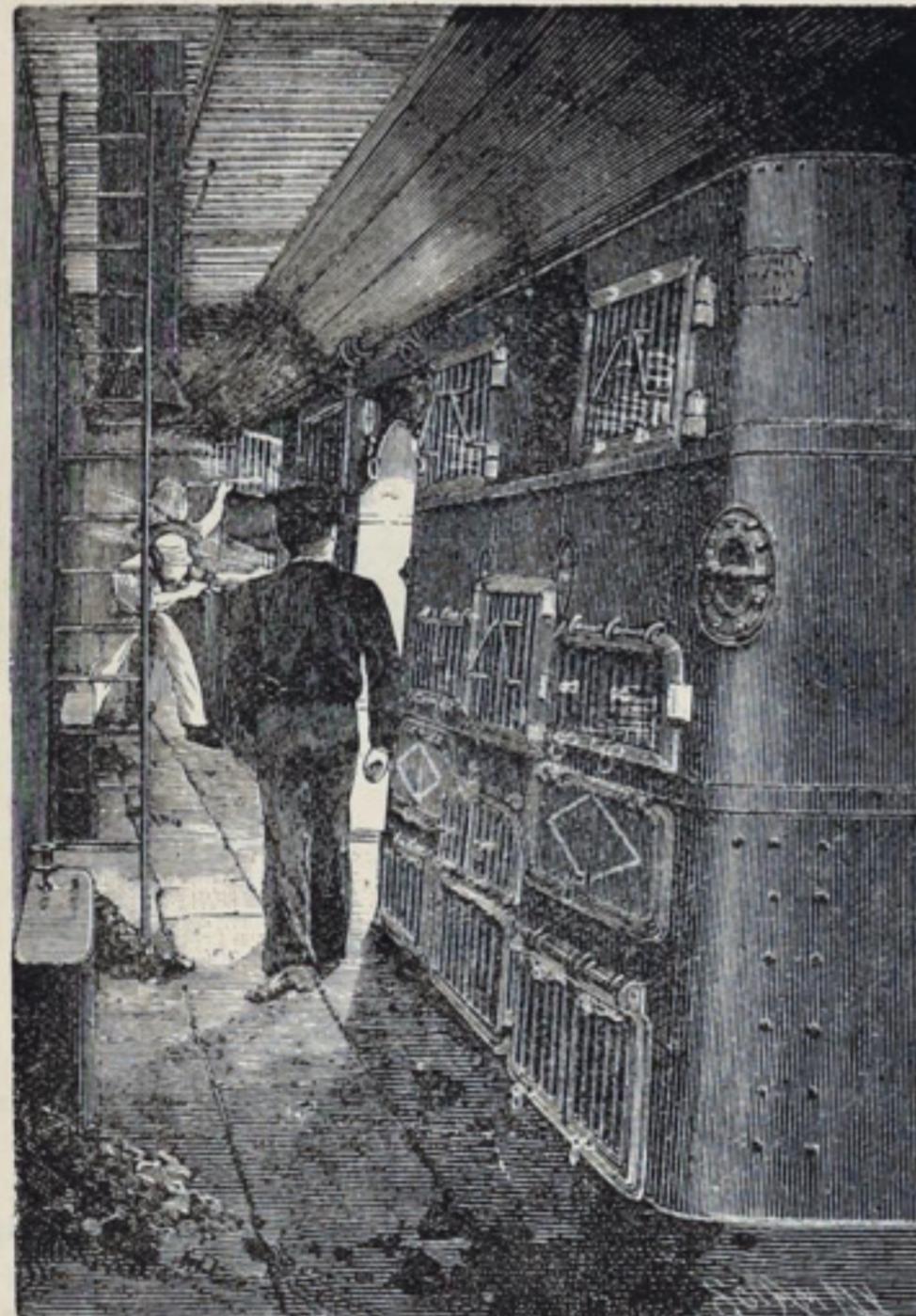
The beginnings of the era of steam are recalled by the illustration of the first vessel ever propelled by a steam driven screw, upon the waters of any country—the twin screw steamboat invented and constructed in America by an American, John Stevens, 1804. The original engines were exhibited in the gallery of the transportation building. Fulton's steamboat, the Clermont of 1807 is next, and following is the side-wheel transatlantic steamship which was the queen of the seas until 1840, while upon the ebony base will be found in carved ivory a graphic representation of the highest type of the fast transatlantic liner of 1893.

THE LUCANIA now excels all records of ocean steaming in having made the round trip from New York and back again at an average speed of 21 $\frac{1}{4}$ knots per hour over a distance of 5,784 knots.

Great Claims Made for a New Boiler Furnace.

Dispatches from New York, a few days ago, announced the arrival there of the Hamburg-American Line steam-ship Grimm, which is fitted with an improved boiler furnace, known as the Rudolph Muller furnace. The furnace is in extensive use on the continent of Europe but the first satisfactory practical test of it at sea has been made on this voyage with the Grimm. As it is claimed that a saving of 30 per cent. in fuel has been secured on the voyage and the firing made much easier for the men, with almost an entire absence of smoke, a description of the apparatus, with illustrations taken from the *Scientific American* will prove interesting.

The Grimm was provided with Scotch tubular boilers and Fox corrugated furnace chambers. The Muller furnace was applied directly in front of these, their doors having been removed. The original boilers are left virtually intact. A rectangular chamber with double sides is fixed in front of the boiler with an opening for the flames, directly opposite the original door aperture of the boiler. The chamber is built of boiler iron.

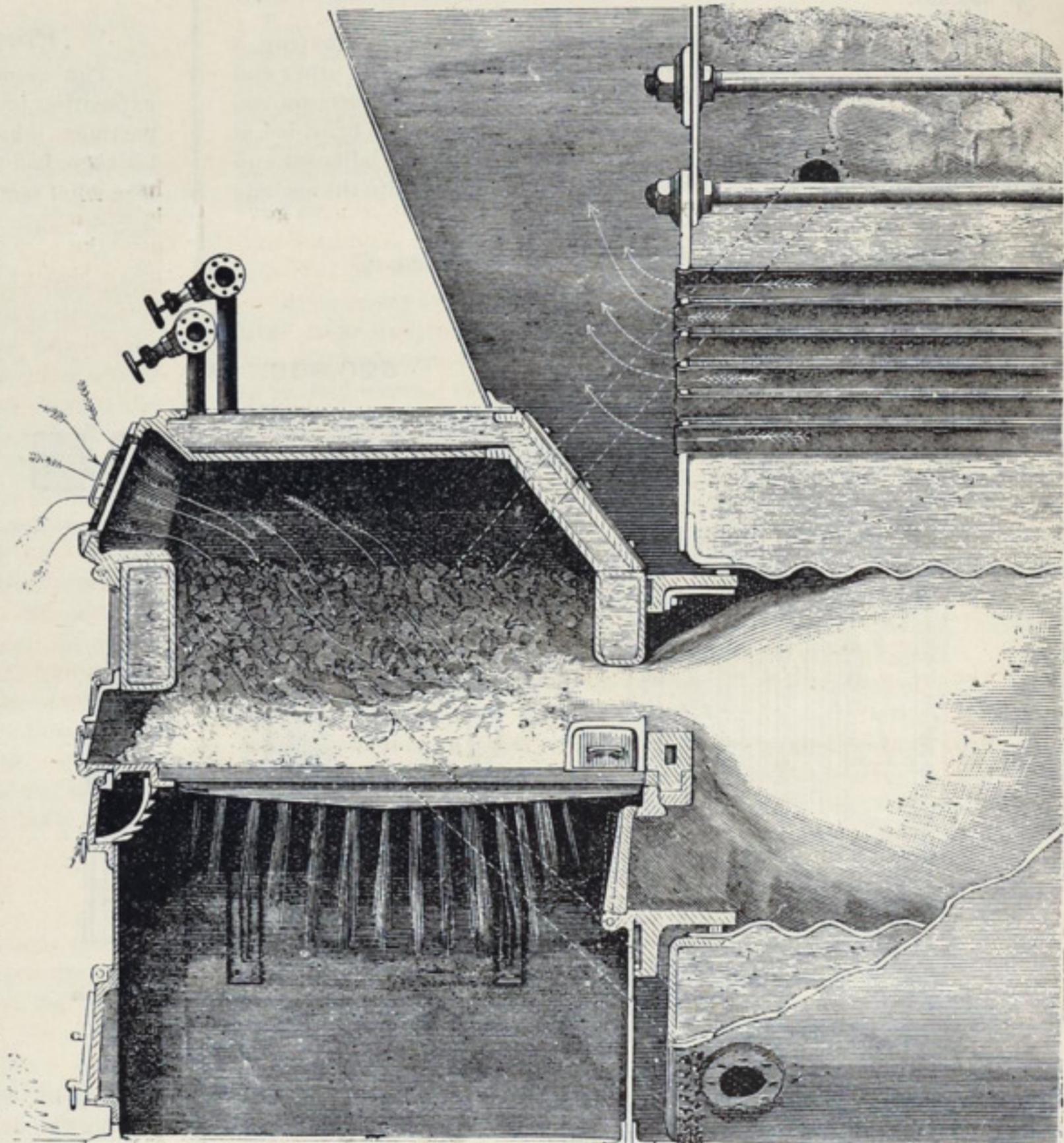


On a level with the lower edge of the door of the boiler is the grate, of common horizontal type, which fills the entire horizontal sectional area of the chamber. The front of the chamber has three doors. One near its top is the coal or firing door; one on a level with the grate is the cleaning door; a third is near its bottom and opens into the ash pan. The doors are provided with dampers to regulate the admission of air. The double walls, the space between which is filled with water, are in two sections. The lower section, which is stayed, connects by two pipes with the boiler, so that the water in it circulates and forms part of the active contents of the system. The upper section is kept full of water, but does not connect with the boiler.

The fire is started on the grate as in an ordinary furnace. When a hot fire, 6 inches thick or more, has been produced, the firemen shovel coal into the upper door until the chamber is filled up to its level or more. This may represent half a day's fuel. The upper door is closed and the dampers on it and on the ash pit door are regulated to bring about perfect combustion. The air entering the ash pit door keeps a hot bed of coal upon the grate. The air entering by the firing door penetrates the bed of coal and works its way down toward the grate. The gases produced enter the former furnace chamber of the boiler; air which has drawn down from the upper door enters along with them and an intense combustion ensues, filling the space with a white hot flame. As the damper on the lower door is opened more widely, the hot bed of coal increases in depth and less air enters from above. As this damper is closed the reverse

takes place, the hot bed of coal diminishes and a greater proportion of air enters from the upper damper. Analogous actions obtain for the dampers on the upper or firing door. It must not be understood that all the air which enters by the upper dampers finds its way through the coal unaffected. Much of its oxygen is consumed before it enters the boiler proper, but by setting the dampers in the required relation to each other the amount of oxygen left unconsumed can be adjusted so as to insure complete combustion of all gases before they leave the furnace chamber of the original boiler. Peep holes at the side are provided through which the flames can be watched. They appear almost as bright as an electric arc light.

The fire on the grate with a mass of coal above it is not a very hot one. This prevents the formation of slag, of which but a small quantity is produced. Most of the ashes appears as a sort of sand, and the slice bar has but little work to do. Handholes for cleaning out sediment are provided in the lower section of the water chamber.



Notices to Mariners.

About the 18th inst. a coast light of the fifth order, showing fixed white, varied by a red flash every forty-five seconds, will be re-established in the light house on the northerly side of the mouth of the Manistee river, Lake Michigan. The light may be seen about fourteen miles in clear weather. It will be obscured when bearing E. S. E. at points less than 800 feet from the outer end of the north pier. On the same date a fixed red light will be established near the outer end of the north pier, 2,022 feet N. N. W. from the above described light, and with it will form a range for approaching the harbor. The steam fog signal will be moved without change of characteristics, from the south pier to the new house on the north pier and the two fixed red lights on the south pier will be discontinued.

The first-class can buoy, marking the reef off Racine, Wis., has been reset.

Official Numbers and Tonnage.

Official numbers were assigned the following lake vessels by the Bureau of Navigation, E. T. Chamberlain, commissioner, during the week ending June 4. Sail.—Grampian, tonnage, 844.41 gross, 802.19 net, Port Huron, Mich., No. 86,293; North Star, tonnage 6.29 gross, 5.40 net, Marquette, Mich., No. 130,665. Steam.—Bon Amie, tonnage, 226.95 gross, 149.69 net, Grand Haven, Mich., No. 3,626; Shenandoah, tonnage 2,251.69 gross, 1,880.10 net, Port Huron, Mich., No. 116,623.

Around the Lakes.

Soundings in Muskegon harbor are said to show 16 feet 3 inches at the shallowest point.

Plans for Cleveland's new fire boat hull were prepared by the Globe Iron Works Company.

Capt. Dahlke of the tug Worswick, Cleveland, added another to the list of lives he has saved, by pulling an old lady out of the river last week. This makes fifty-eight lives that have been saved by him during the past twenty-five years.

Galvin, Clark & Boland, vessel brokers of Buffalo, have dissolved partnership. Capt. Galvin is expecting to be appointed supervising inspector of steam vessels and Mr. Boland will, it is said, be given an interest in the firm of Brown & Co.

Two more rigs will be added to the dock plant of the old river furnace to be put in order soon by Corrigan, McKinnie & Co. The dock has capacity for 200,000 tons and has four rigs at present.

As a contradiction to the report that the Niagara river channel was unsafe for boats of ordinary draft, it is claimed the tug Cascade towed the Mary Burke, drawing 14 feet from Buffalo to Tonawanda.

Capt. Sidney J. Millen, son of the well known Detroit vessel owner has been appointed local inspector of hulls at Detroit, Mich., in place of Hugh Coyne, who resigned on account of continued illness.

Steam yachts Visitor and Leroy Brooks, seized by the Dominion government because passengers threw their hooks over the boundary line for fish, have been bonded and taken back to Sandusky. The seizure will be fought through all the Canadian courts.

W. M. Hayden, 1007 Society for Savings building, Cleveland, O., will make a specialty of taking depositions and testimony in marine cases. Any one having business of this kind will find his services satisfactory as he has had considerable experience in such matters.

Machinery for Davidson's steamer "No 61," which is being built at West Bay City, has been shipped from the Frontier Iron Works, Detroit. The engine is a ponderous affair, making several car loads. The engine for the fast McElroy steamer is about ready to be shipped.

A mass meeting in Toronto, presided over by Mayor Kennedy, passed resolutions calling on the government to deepen all canals to 20 feet. A committee was appointed to arrange for an international convention to consider the deepening of all waterways common to the United States and Canada.

Tug owners at Chicago have agreed to discontinue the practice of going out into the lake to meet incoming vessels, and will hereafter lie at the mouth of the harbor and take their turns at towing. The competition has been so strong that tugs sometimes went 100 miles or more up the lake in search of vessels.

The hull of the Waldo A. Avery, which was burned at McGulpin's point last fall, was raised by the wrecker Roanoke. The hull is not greatly damaged, and fifteen car loads of corn remain in the hold. The corn is sour, but is not considered spoiled. The wreck will be towed to Thompson Smith's Sons' dock at Cheboygan.

The United States health officials at Detroit have engaged the steam yacht Florence B. and established a quarantine service in Detroit river. They board all boats from Chicago and examine them for traces of small-pox. During days the boat will be stationed at Detroit, but at night she will go to the St. Clair flats canal.

Experiments are being made in Chicago on the tug Black Ball with petroleum fuel. Steam was kept up and at much less expense than with soft coal. The experiments are under the supervision of city smoke inspectors, and it is thought a solution for the tug smoke problem has been found. A public test will be made Saturday.

Dispatches from Chicago would indicate that the Goodrich company is intending to give the whaleback steamer Christopher Columbus a very warm welcome in the matter of low excursion rates on Lake Michigan. After an unsuccessful season at the fair, it would seem that this intimation will not be relished by the owners of the Columbus.

Captains who complain of bars at entrances to harbors when they touch them in going in ought to take courage from the fact that the passenger steamer Saugatuck was expected to be delayed several days digging through the bar that forms at the mouth of Saugatuck harbor every winter. This year it left only two feet of water in the channel.

The Lake Line Agents' Association is an appreciative body. They banqueted J. S. Dunham at the Union League club, Chicago, for the successful efforts put forth in Washington recently to prevent the erection of a center pier at La Salle street for the Northwestern elevated road. It is believed that no more center piers will be built in Chicago river.

At the ship yard of the Globe Iron Works Company, Saturday, the last of three steel harbor tugs built for L. P. & J. A. Smith, Cleveland, was launched and named J. R. Sprankle. Although a contract for the construc-

tion of these boats was given to Robert Curr, they were designed by the Globe company and all material, as well as the use of tools were furnished by that company.

J. K. Bole of Cleveland died suddenly at Chester, Pa., on the 8th inst. Mr. Bole was president of the Solid Steel Company of Alliance, O., and was also president of the combination of steel casting companies, which he was instigative in bringing about a short time ago. He was a director in the Otis Steel Company of Cleveland and one of the receivers of the Valley Railway of Ohio.

John C. Fitzpatrick, formerly with Mitchell & Co., and recently of Duluth, has formed a partnership with Capt. Alex. Clark, the remaining partner of Galvin, Clark & Boland, and will conduct a vessel brokerage business at 60 Main street, Buffalo. Mr. Fitzpatrick was agent for the C. & B. line at Buffalo last season, and his acquaintance in Cleveland ought to bring him some business.

It is customary to celebrate an anniversary by taking a day off, but Mr. Geo. B. Raser, manager of the P. Y. & A. dock at Ashtabula completed his twenty-first year in the service of the company this week by unloading 4,734 tons of ore from the steamers German and Onoko at his dock in twelve hours and fifteen minutes. This is believed to be as good time as made by any dock of similar size on the lakes.

Over 4,000 sailors have been vaccinated at Chicago since bills of health have been exacted, which was discontinued Sunday, although vaccination is still urged. If the work was well done and the right kind of vaccine used the sore arms will show results in slack firing, and there will not be much bearing down when the decks are being washed. It will make an excellent excuse, however, whether there is any ground for it or not.

Thomas C. Fitzgerald, recently with the Lake Shore Iron Works, asks captains and engineers to note the fact that the Soo City Machine and Boiler Works at Sault Ste. Marie is operated by electric power and with its large steam hammer presents excellent facilities for repair jobs. Prices will compare favorably with those at lower lake ports. The superintendent can be found nights at the Chippewa House. The works are on Union dock.

Chicago will be made the center of a radical movement for the practical improvement of the signal service as relating to the lake marine interests. Each of the forty signal stations on the lakes will post some six copies of the telegraphic report of information at places in the port most accessible to vessel captains. All vessels will be furnished with a list of the places. In case of the approach of a destructive storm, signal men will be obliged to notify every vessel in the port, even if it becomes necessary to employ a tug to reach vessels with the alarming information.

In General.

The Massachusetts House of Representatives has passed a bill incorporating the Massachusetts Ship Canal Company with a capital stock of \$7,500,000. The company is authorized to construct a canal across Cape Cod from Nantucket sound to Cape Cod bay.

A spare length of nickel steel shafting constructed for the American liner Paris, has tensile strength of about 90,000 pounds, probably 25,000 pounds more than any British or German steel shaft. It has been established by tests that nickel steel has a higher elasticity than ordinary steel to the extent of 31 per cent., and that the tensile strength is 20 per cent. greater.

The borings the light-house board has been making on Diamond shoal, off Hatteras, N. C., have been successful. A solid bottom has been found, and a light-house can now be erected. An appropriation of \$500,000 for this purpose is now available, and the work will be pushed as fast as possible. Since the old light-house was destroyed numerous marine disasters have occurred there.

Charles H. Cramp, president; Benjamin Brewster, vice-president; Henry W. Cramp, secretary and treasurer; Thomas Dolan, Clement A. Griscom, William M. Cramp, Samuel H. Cramp, Jacob C. Cramp and Henry Seligman are the directors elected by the William Cramp & Sons Ship and Engine Building Company, at Philadelphia, last week. The past year's business was the greatest in the company's history.

A "keep of the grass" area has been marked in Halifax harbor. It is marked by four spar buoys painted red, and surmounted by cross heads, painted red and white. Skull and cross-bones will not be used as they will be furnished by sailors on board craft that get in the limits while practice with magazine rifles is proceeding at the government rifle range. A red flag is kept flying on an island near by to further warn vessels.

The new U. S. cruiser Minneapolis, sister ship of the Columbia, was given a preliminary trial trip by her builders, Wm. Cramp & Sons, last week. Although she burned anthracite coal and was under disadvantage she made 21.75 knots as against the Columbia's 20.98 knots on her trial trip. This will awaken considerable interest in the trial for the government, as it would indicate that she will surpass the 22.87 knot record of her sister ship.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O. Chicago office, (branch), No. 726 Phoenix building.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,761 vessels, of 1,261,067.22 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1893, was 318 and their aggregate gross tonnage 525,778.57; in all other parts of the country the number of this class of vessels was, on the same date, 211 and their gross tonnage 314,016.65. The classification of the entire lake fleet on June 30, 1893, was as follows:

Class.	Number.	Gross.
Steam vessels	1,731	828,702.29
Sailing vessels.....	1,205	317,789.37
Canal boats.....	743	76,843.57
Barges.....	82	37,731.99
Total.....	3,761	1,261,067.22

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
1889.....	225	107,080.30
1890.....	218	108,515.00
1891.....	204	111,856.45
1892.....	169	45,168.98
1893.....	175	99,271.24
Total.....	991	471,891.97

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1893	1892.	1891.	1893.	1892.	1891.
No. vessel passages	12,008	12,580	10,191	3,341	3,559	4,207
Ton'ge, net regist'd	9,849,754	10,647,203	8,400,685	7,659,068	7,712,028	8,698,777
Days of navigation..	219	223	225	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

IN DISCUSSING with a party of vessel owners the subject of harbor tugs carrying passengers, Mr. H. M. Hanna brought up an interesting point the other day. He says that he had reason to investigate the subject in the interest of a Toledo fishing and hunting club and took the matter to Gen. Dumont of the steamboat inspection service, who held that the law requiring life preservers, etc., was never intended to apply to boats running within harbor limits, and that there could be no prosecution for carrying small parties of passengers within such limits. The law was intended, he held, to prevent harbor tugs or other small freight boats engaging in passenger traffic for hire.

OWNERS of Chicago's despised lumber hookers are about to show the big shipping companies of the lakes an example, in their determination not to move vessels until paying rates of freight can be secured. Probably no class of business men in this country could unite and demand a fair return on their investments to better advantage, mutually, than the owners of ore grain and coal carriers on the lakes, and yet jealousy with other causes have prevented such action at times when it would seem entirely warranted. The best feature of the Chicago movement is the understanding among employees that the owners are to be supported in the stand they have taken. Every vessel owner will admit that he made most money when he was able to pay good wages.

"DURING all my time in the iron ore and vessel business," said Mr. Harvey H. Brown a few days ago, "I have never known pig iron stocks—non-Bessemers as well as Bessemers—to be cleaned up as they are at present." Other men in the iron business verify this statement. It is well for everybody concerned that such is the case.

OF COURSE it is to be expected that the Canadian Sault canal, which will be opened about July 15, will be free to both American and Canadian vessels, as the canal on the American side has been for years. This canal will facilitate Lake Superior traffic to an extent that may have some bearing on freights.

NEW YORK state is to have another canal convention. They occur often but accomplish little. The fact is New York state is growing more tired every year of maintaining a canal that should be owned and maintained by the whole people of the country.

A FIELD FOR the employment of young men in the cities on the lakes has been overlooked, most of the mates and masters on lake vessels having come from the country. Young men do not like to go through the rough treatment of washing down decks, or shoveling coal on some lake steamer, with rare opportunity for advancement to position of captain, engineer or mate, notwithstanding a number of the wealthier vessel owners and managers began at the bottom of the ladder. To those young men who have inclinations to become young tars the plan of Mr. George P. Blow, U. S. N., in charge of the hydrographic office at Chicago, will prove to be valuable. He proposes to establish a school-ship at Chicago for training lake seamen. He says all the large cities on the coasts have such school-ships, and he thinks the lakes have been neglected in this matter. A seaworthy government steamer will have to be secured from the secretary of the navy, and naval officers will be detailed as instructors. In a few years the school would graduate young men who would be expert in navigation and other sciences that have been thought heretofore to be useless on lake vessels. Graduates would no doubt find employment as second mates or wheelmen at least.

Ship Canal Canards.

Inventors of propeller wheels, especially those embodying radically new features usually hail from some inland town or state, and no doubt the author of the bill to provide for a preliminary survey for a ship canal from the lakes to the Ohio river knows nothing about lake transportation, or in fact anything that is practical in connection with any commerce. This project bobs up every little while, and occasionally gains a little support from those who do not look twice at the matter and see the absurdity of it. The authors of these Ohio ship canal schemes never stop to think of the fact that the flat bottom light draft river boats have to lay up every once in a while on account of low water. The projectors can not hope to make this canal part of an export route from the lakes to salt water, as the distance from the lakes to New Orleans alone is greater than from the lakes to the Straits of Belle Isle, which is only 2,384 miles from Liverpool, while it is 3,540 from New York to Liverpool, not considering the distance from New Orleans. Even consideration of export trade by this route is folly, and as long as the depth of water out to Cairo for six months in the year ranges from five to six feet, and the 162 steamers in the river trade above St. Louis have trouble getting cargoes the building up of an inland commerce by means of such a canal is rot. Boats that can go from Cincinnati to Cairo, can, through the Ohio canal, get from the lakes to the Ohio at Portsmouth, for there is at present a draft of four feet attainable in this canal already built, but not maintained very well because of lack of business. If the plan was at all feasible or possible, the lake commerce interests as well as those of the Mississippi river would be in touch with the project. The plan to spend \$20,000 for a preliminary survey should certainly receive the attention of some Holman.

In connection with the above it is noted that a far more rosy tinted scheme is being fanned in Canada. E. A. MacDonald recently addressed the Rochester chamber of commerce on the advantages that would accrue from this proposed Georgian bay and Toronto ship canal. On account of facilities at Charlotte he claimed Rochester would be the terminal port, from which coal could be shipped on return trips. He was sanguine over the prospects of having the first \$1,000,000 of the necessary \$50,000,000 subscribed by the end of the month. It is time to show up the futile plans when the last million is subscribed and the first \$1,000,000 paid in. The canal is supposed to be 66 miles long with a depth of 22 feet, the ships to be propelled by electricity generated by water power from Lake Simcoe. It will save a distance of 600 miles per round trip from New York to the Soo and is far less dangerous than the route by the flats of St. Clair. The promoter does not say whether he will use the trolley or the storage battery system, or whether he will build special boats or replace the machinery in the present lake fleet with electrical machinery. As the canal is to be finished in two and a half years, lake vessel owners ought to be informed, so they can prepare for this change. In the mean time it might be advisable for stock subscribers to specify payment when the boats are put in operation.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on June 9, 1894:

	Wheat, bu.	Corn, bu.
Chicago.....	19,199,000	3,047,000
Duluth.....	7,351,000
Milwaukee.....	1,085,000	3,000
Detroit.....	1,729,000	18,000
Toledo.....	2,491,000	51,000
Buffalo	1,443,000	189,000
Total.....	33,298,000	3,308,000

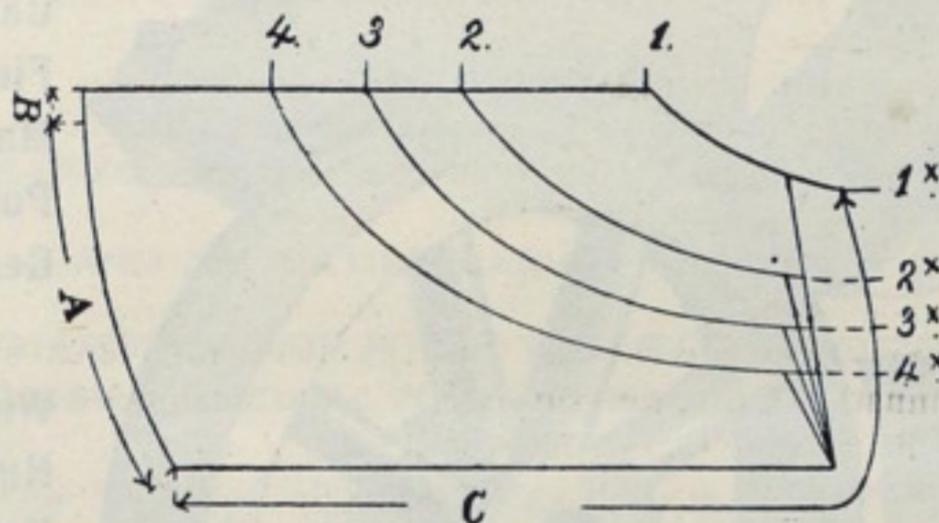
At the points named there is a net decrease for the week of 1,225,000 bushels of wheat and 298,000 bushels of corn.

The Joy and Other Valve Gears.

George C. Shepard of Cleveland writing on engineering subjects in the REVIEW of March 15, 1894, said: "In a conversation with a prominent engineer on the lakes I was asked for an opinion concerning the Joy valve gear. A favorable reply elicited an unfavorable one from the engineer, and his reasons were that in the Joy valve gear there were no opportunities for changing the lead without cutting and mutilating somewhere, and also that the constant lead would not permit of high rotative speeds, such as are developed at times on the cruisers of the navy, unless the lead was made large, in which case it would be too much for the lower speeds generally used. Regarding the changing of the lead, the gentleman's opinion is a good one, but the opportunities for changing are as good with a Joy valve gear as with the Stephenson link gear, in which the go ahead and backing eccentrics are cast together, as is the case on too many of our large engines. Supposing the engines on the cruisers are designed for economy at low speeds and their valves have leads corresponding; now, using the Stephenson link this lead is diminished when the engine cuts off longer, as is necessary for higher speeds than the economical, while with the Joy gear the lead is the same at long or short cut-off, and would be greater at a long cut-off than with the Stephenson gear, supposing both have the same lead at economical speed."

Hale G. Robinson, an engineer of Port Huron, Mich., is of the opinion that this paragraph contains some misleading statements (not intentional, he adds), and in a communication to the American Shipbuilder of New York, in which the matter was copied, he discusses the action of steam distributed by Joy or similar constant lead and compression valve gears, such as the Morton, Marshall, Mudd and others. He says:

"Mr. Joy is one of the few engineers, from Watt and Evans to the present day, who succeeded in bringing out a valve gear that would retain a constant lead and compression with variable cut off, thereby increasing



the mean effective pressure without changing the lead and compression from the friction of the engine to full load. The Joy valve gear is a boiler pressure gear and must be so dealt with in designing the engine it is to be used on. Its action is quick to open and close, but slow on the center, a movement not found in the link gear, with its even travel, that admits of wire drawing; and to assist the boiler in maintaining its pressure to point of cut-off the double and triple ported valve was introduced; but while it improved the steam distribution it did not aid the lead and compression, owing to the nature of the gear. Referring to the accompanying drawing, we will take a theoretic diagram of a single cylinder engine, which in practice would have rounded corners, but not so much as would occur with slower motion of the link gear type. A is the compression caused by the inside lap of valve closing before the piston reaches the end of its stroke, which should be sufficient to balance the reciprocating parts without lead or opening to the boiler, which takes coal. This is brought to perfection by Mr. Normand of Havre, France, in the torpedo service and should approach as near boiler pressure as practical, which with high rotative speed, is possible; or the heavy parts of engine will do the same thing with slower speeds (within five pounds of boiler pressure is safe), and can be determined by the weight of the reciprocating parts at the medium speed, and does not change much at maximum or minimum speeds with valve gear of this type, by compressing from three to six volumes into one. (It depends on the clearance of the engine). A compression volume is that number of cubic inches between the piston face and valve face when the engine is on its center, and usually takes as much steam to fill it as it does to run the engine light; and when it has to be filled twice for each revolution (both ends of the cylinder), it is worth filling by compression to save coal if not used to balance the engine, but it does both.

"This compression should remain the same, whether for single, compound, triple or quadruple expansion engines and for all cylinders in proportion to balance engine. The low pressure cylinder will take the least, for its initial pressure is the least, the cylinder is the largest and its volume the largest to compress, but it is within easy reach of the inside lap. B is the lead or opening from the boiler to engine, when the latter is on its center, and should be kept as small as possible, with smooth running (from three to five pounds), and not started from exhaust pressure line by opening lead to boiler by rolling the eccentric on the shaft, as with the

independent eccentric link motion referred to, to make up for poor construction, which costs money (in coal), and is detrimental to builders, engineers and lastly the owners, who find out the least about it. It not only gives you an uneven and jerky compression, but is injurious to boiler and engine alike, while the inside lap gives you an even compression at no cost. I have known of leads opened to boilers varying from $\frac{1}{4}$ to $\frac{1}{8}$ inch, to quiet the engine (straight link) while with the radius link it is common at light loads and belongs to the gear. Now it is obvious that if we can keep the lead, compression, and admission unchanged, which is possible in the Joy and like gears, and can vary the point of cut-off from maximum to minimum, we get the rotative effect desired, and this is what Mr. Joy and many others have been aiming at.

"Referring again to the drawing we will observe the points of cut-off at various loads, from 1 for $\frac{3}{4}$ stroke to 4 for $\frac{1}{4}$ of stroke, which take place without changing the lead and compression. Then, again, the points of pre-release vary with that of admission from 1^x for $\frac{3}{4}$ cut-off to 4^x for $\frac{1}{4}$ cut-off, while the distance from end of stroke remains the same, the pre-release, as does the lead compression. The exhaust line C changes in like manner from 1^x for $\frac{3}{4}$ stroke to 4^x for $\frac{1}{4}$ stroke, but is at all times in excess of admission, varying from twice the admission to ten or more times for the earlier cut-offs. A fair idea of what a positive lap and lead valve gear will do will be seen by referring to the steamships El Cid, El Rio, El Norte and others of the Morgan Line, with the See-Marshall valve gear; the Ohio of the American Line, and the Mariposa of an English line, with the Morton gear; the Endfield, Stepeney, Wapping and others with the Mudd gear; the Pennsylvania ferry boats and many more, with the Joy valve gear. It is not the intention of the writer to detract any from the link valve gear, for he is fully aware there are many splendid engines running with the 'old reliable' on both land and sea, and always will be, but that there are other valve gears with better steam distribution there is no mistaking, and the better we become acquainted with them the more convinced we are of their small number of parts, positive action, easy of access and minimum repairs."

Yankee-Doodleism.

BY OUR KENTUCKY POET.

From Fairplay, London.

Say, Britishers, look here; ain't you feeling rather queer?
Guess you'll see some ships worth looking at ere long;
You will find them rather tough, you're going to have it rough,
For beside them your old "tubs" ain't worth a song.
With the Louis and St. Paul we will open out the ball;
We intend to lick creation, that we do;
So, Britishers look out, or you'll all be up the spout,
When we bring our "record breakers" on the blue.

Chorus.

Cramp, Cramp, Cramp, the boys are singing;
Cramp's the only builder up to date;
If you want a proper ship, on the herring-pond to rip,
Cramp's the man that flyer to create.

I guess they'll make you stare, and raise on end your hair,
When you see our "sainted" crackers steam ahead.
For the ocean it is wide, and to douse the British pride,
All our Yankee-doodle bunting we will spread.
You have gone it rather fast, but we've caught you up at last;
You will find that two at hide-and-seek can play;
With our Philadelphia crew, every one a "doodle do,"
We've come at last and here we mean to stay.

Chorus.—Cramp, Cramp, Cramp, etc.

Yes, I guess we mean to stay, and play our little play,
While the stars and stripes are floating in the sky;
From the keel right to the truck you will find no British muck,
And we're going to have our innings by-and-bye.
The time it soon will come when you'll pay a princely sum
To get our Cramps to build a proper ship;
A ship of nickel-steel, oh! how nice 'twill be to feel
That we've got the British lion on the hip.

Chorus.—Cramp, Cramp, Cramp, etc.

Vessels Recently Built in the United States.

Records of the bureau of navigation show that during the first three-quarters of the present fiscal year there were built in the United States and officially numbered 339 wooden sailing vessels of 24,271 tons and 221 wooden steam vessels of 29,848 tons. During the same period three iron or steel sailing vessels were built of 4,749 tons, and twenty-seven iron or steel steam vessels of 26,920 tons. These sailing vessels aggregated 342 in number, and 29,021 tons, in measurement. The steam vessels aggregated 248 in number, and measured 56,869 tons. The entire number of vessels built and numbered was 590, the tonnage being 85,890. No unrigged vessels are included in this statement.

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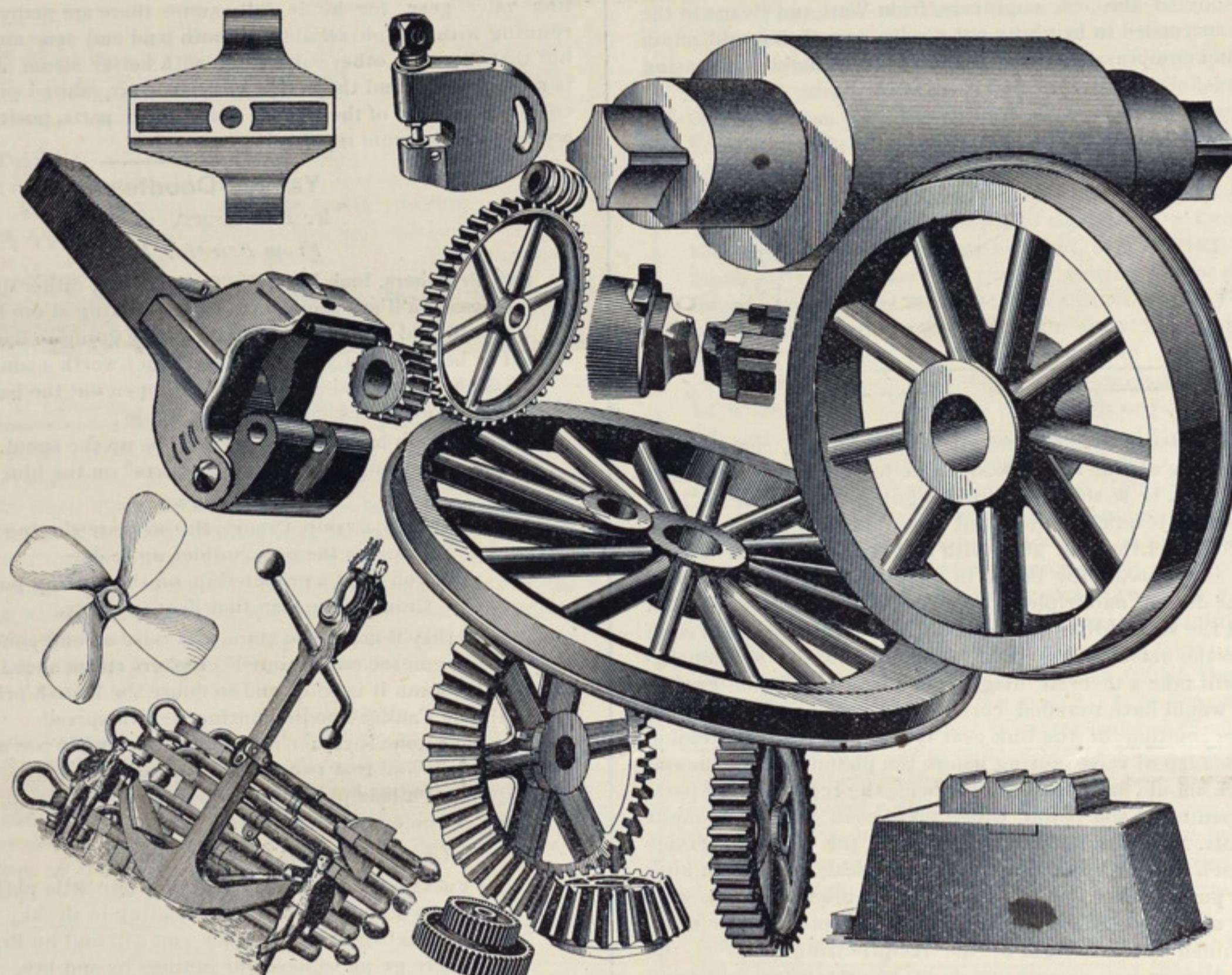
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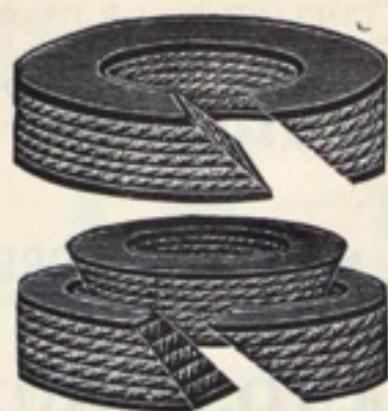
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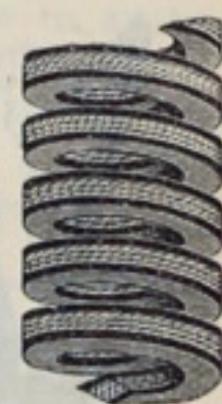
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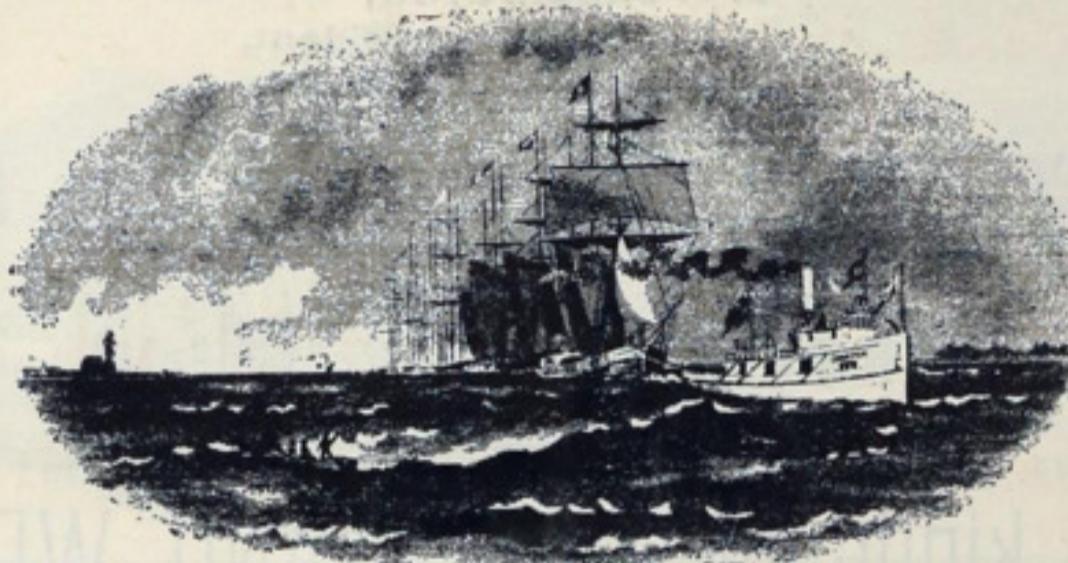
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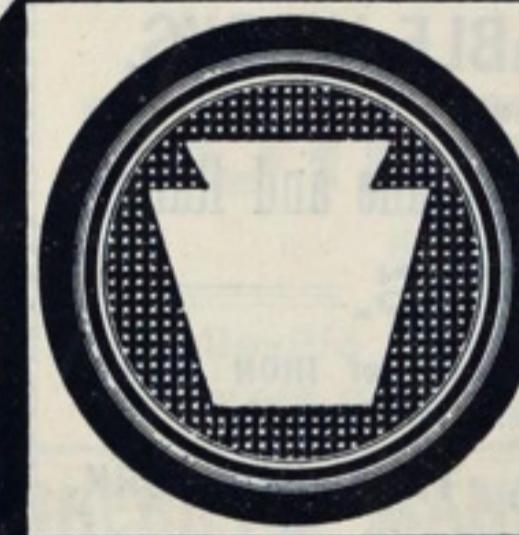
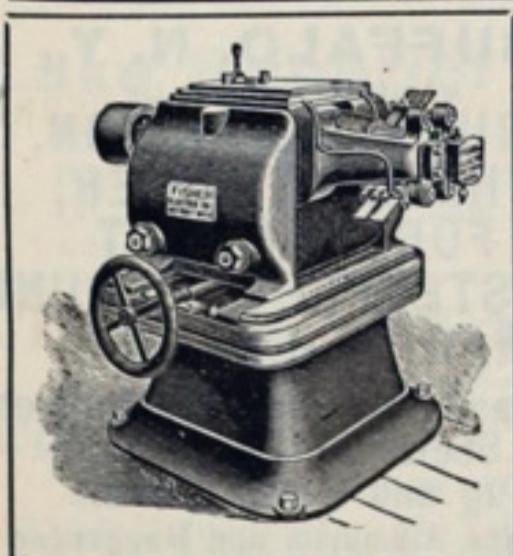
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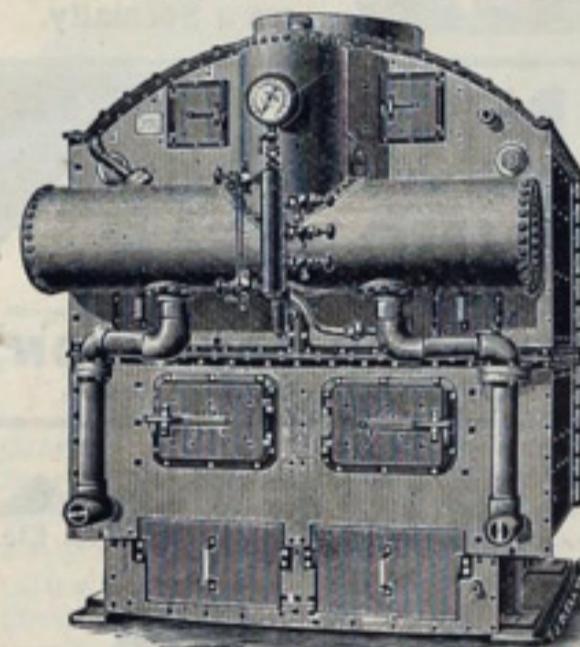
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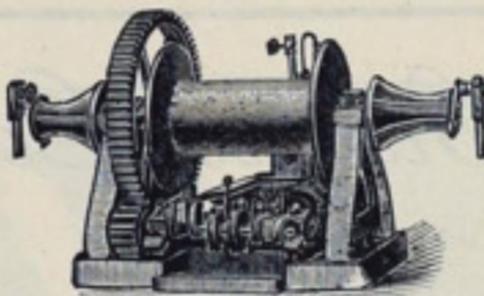
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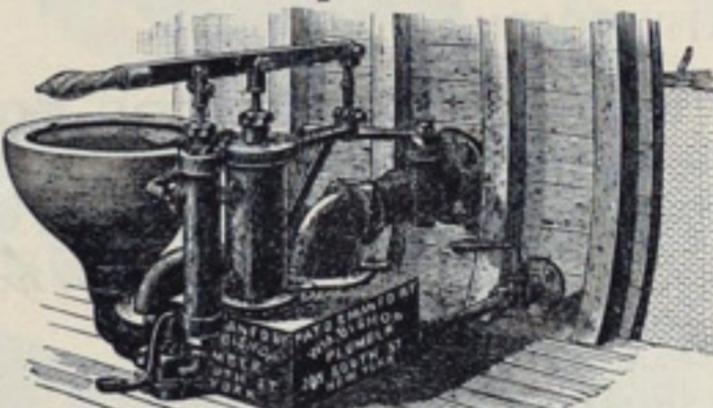
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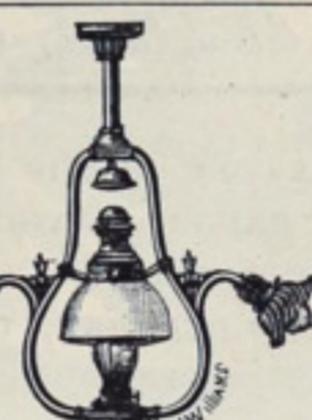
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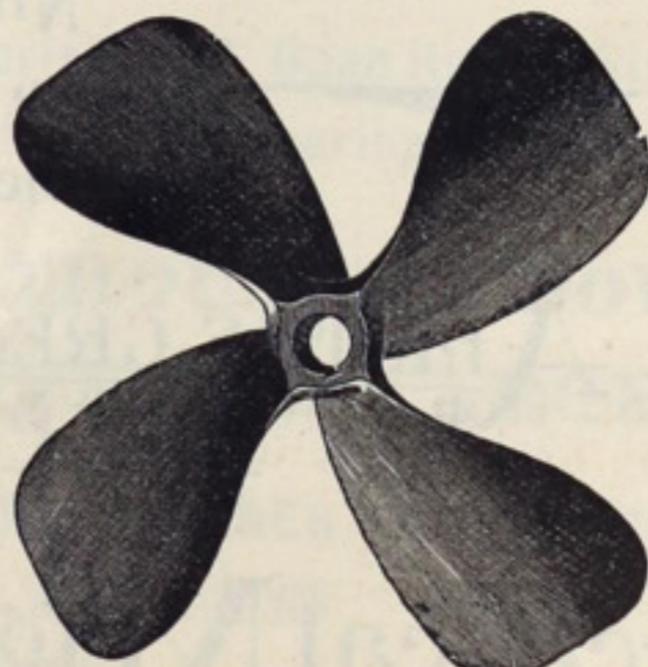
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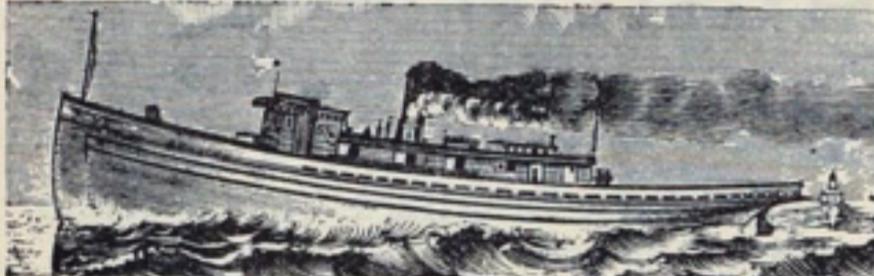
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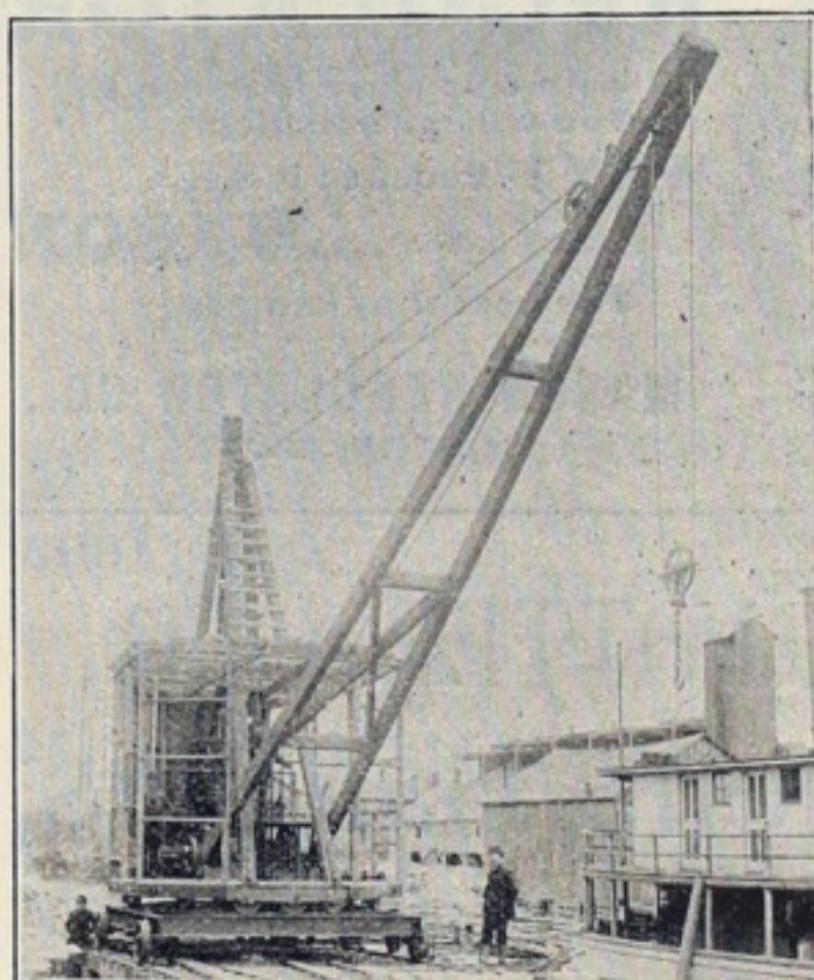
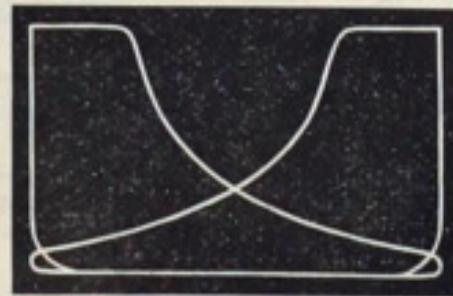
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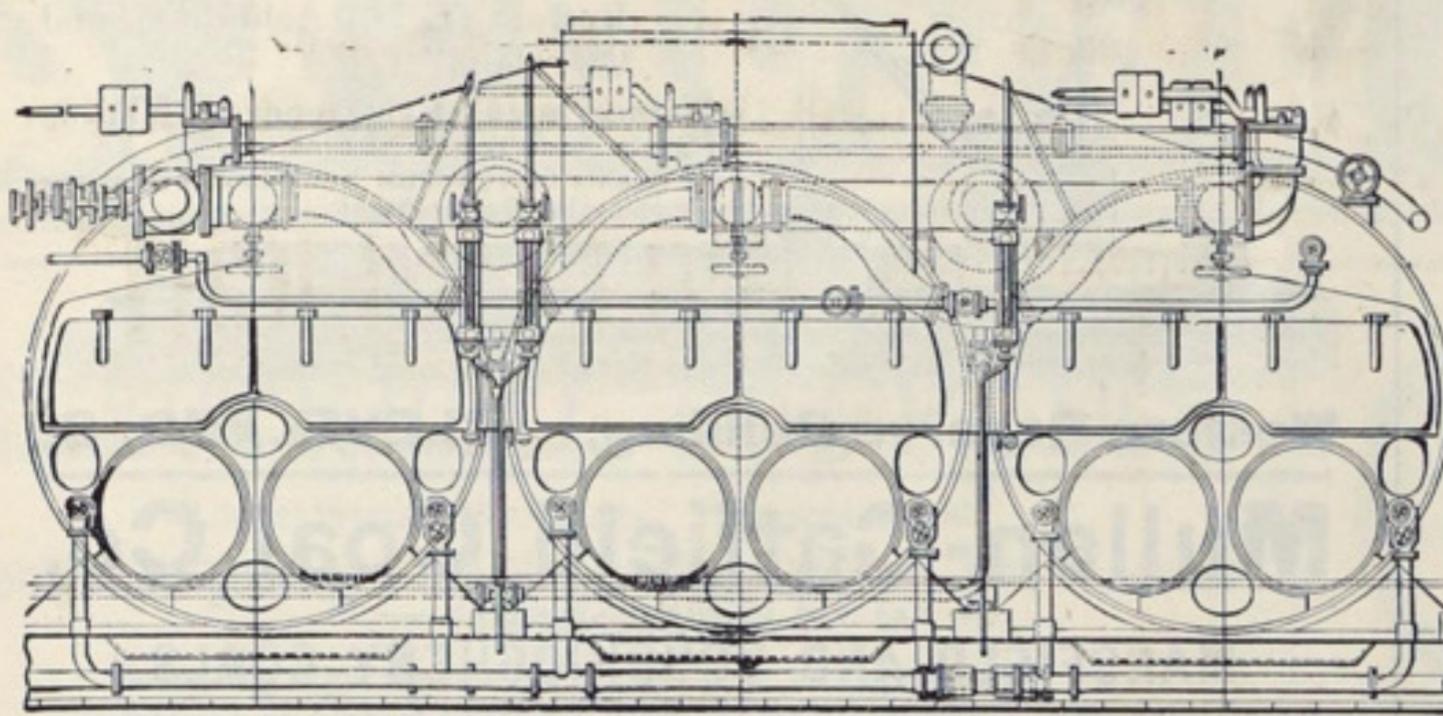
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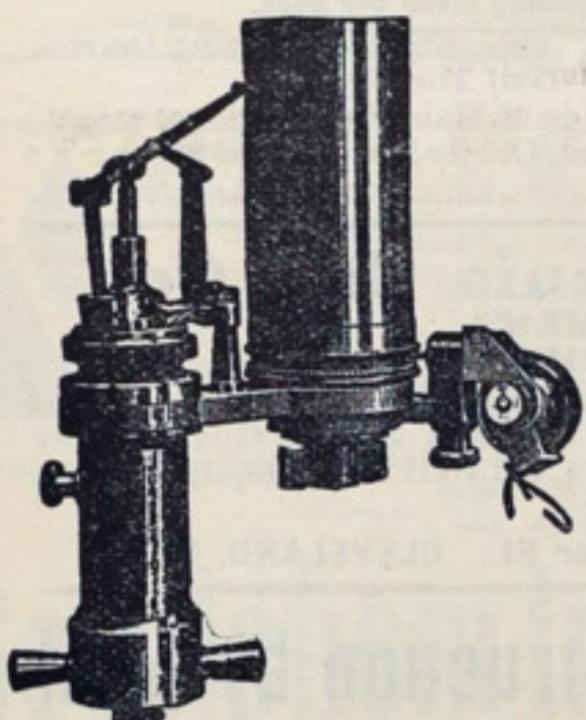
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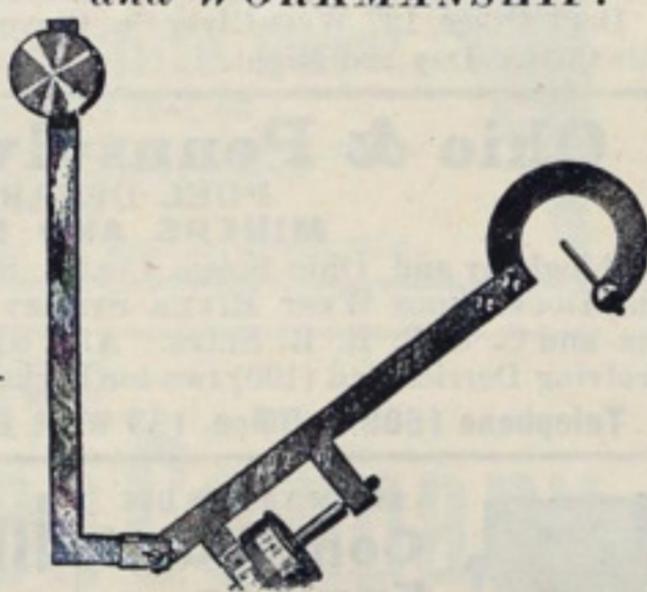
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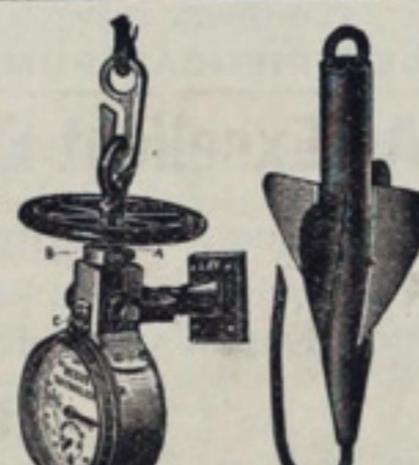
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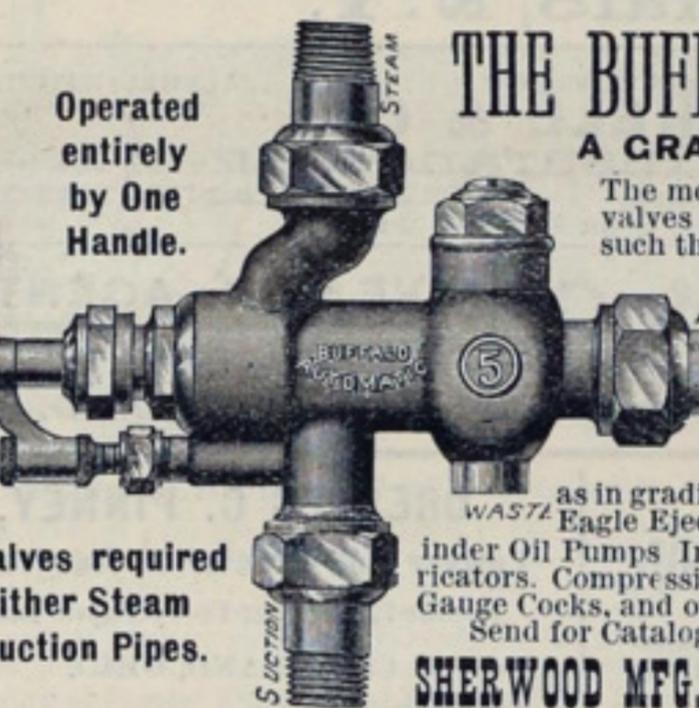
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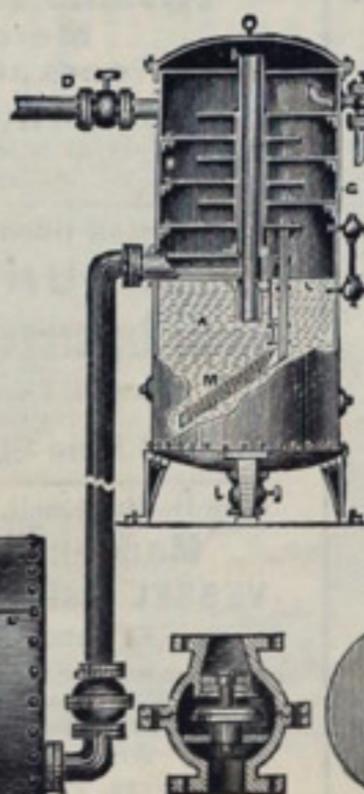
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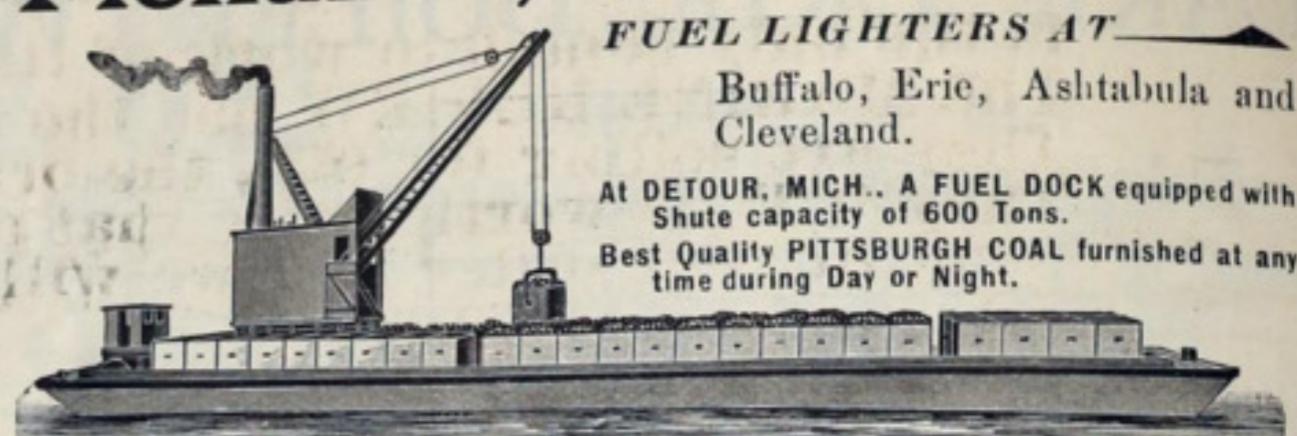
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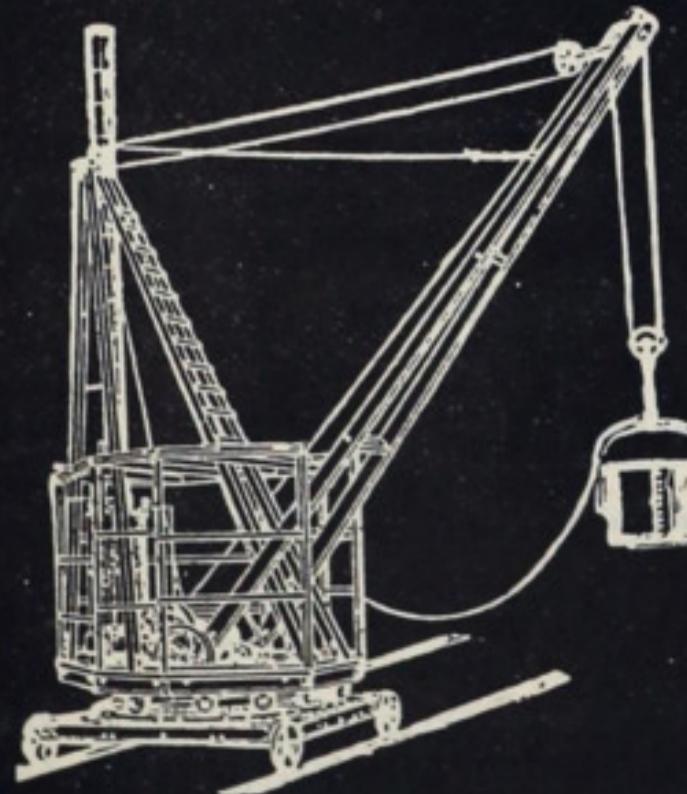
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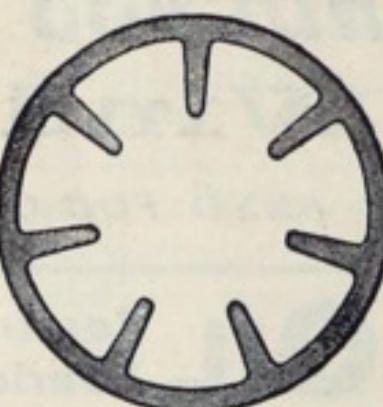
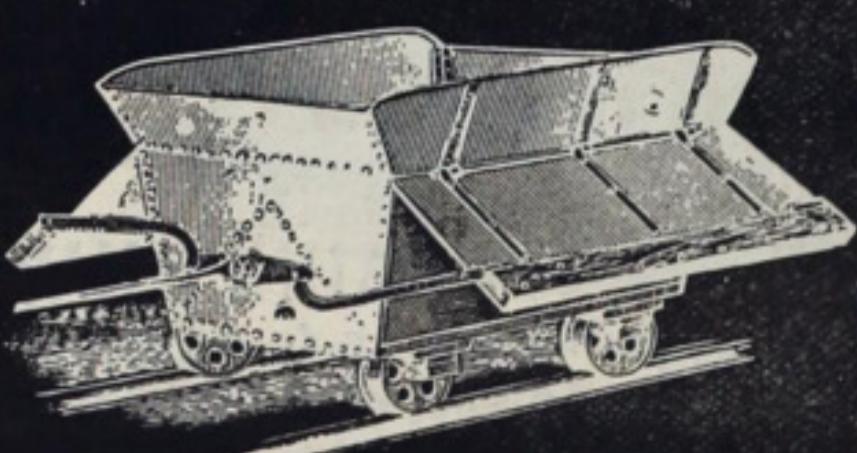
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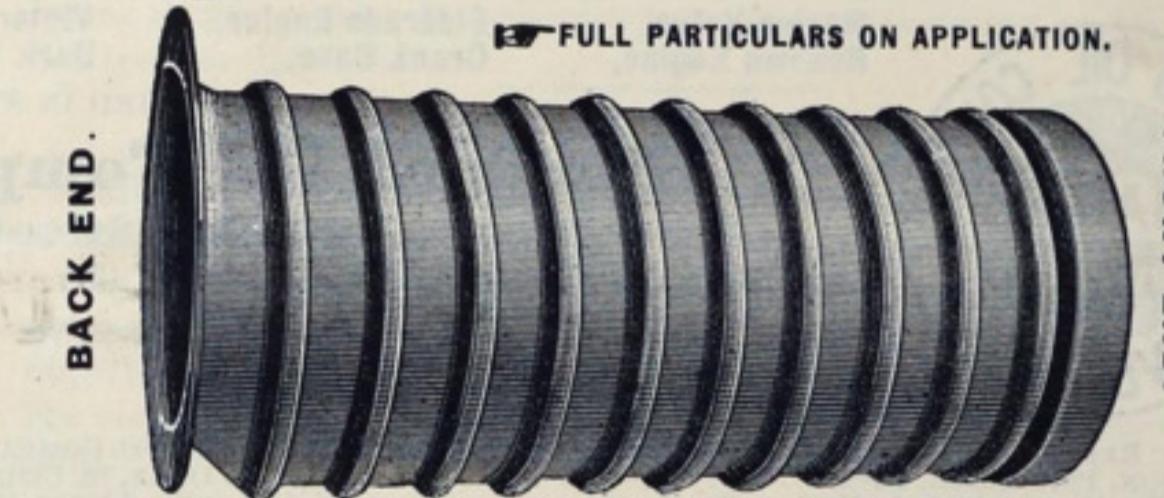
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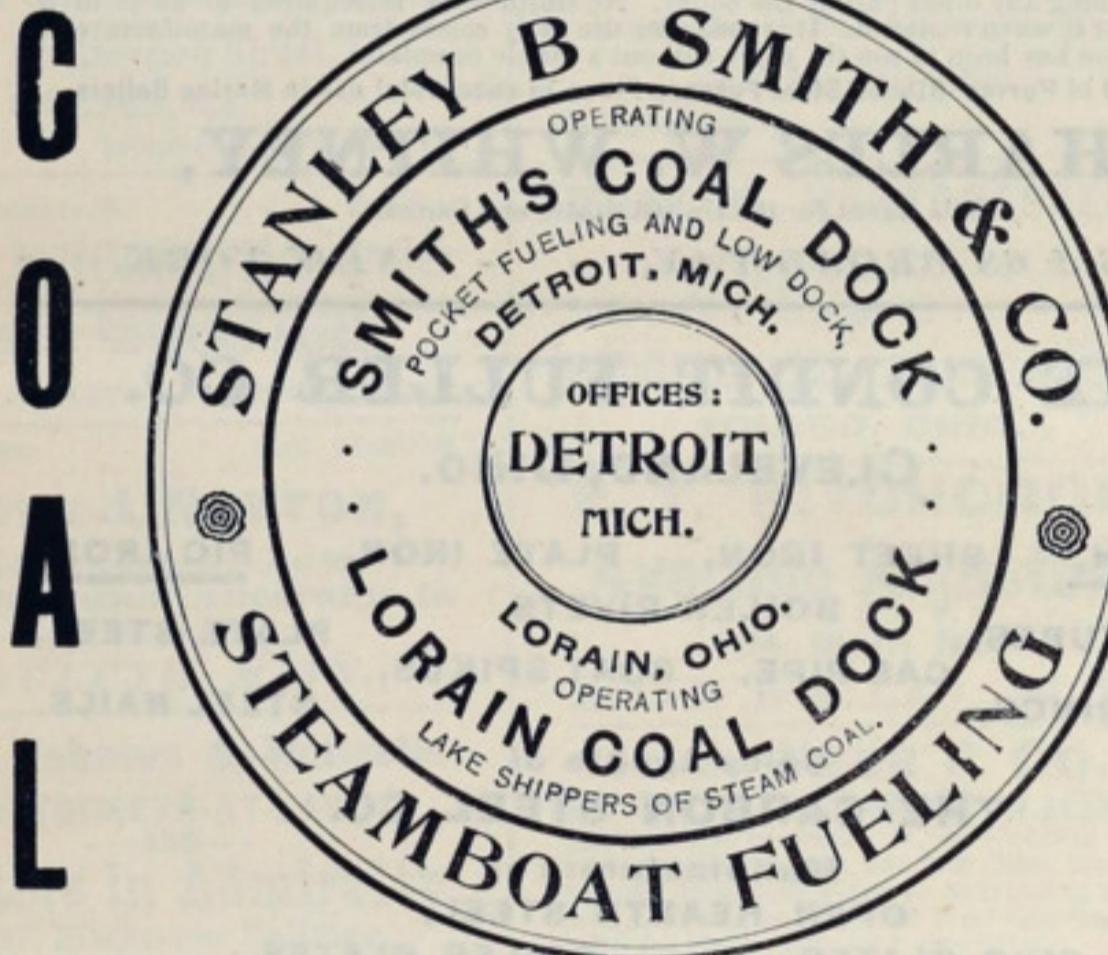
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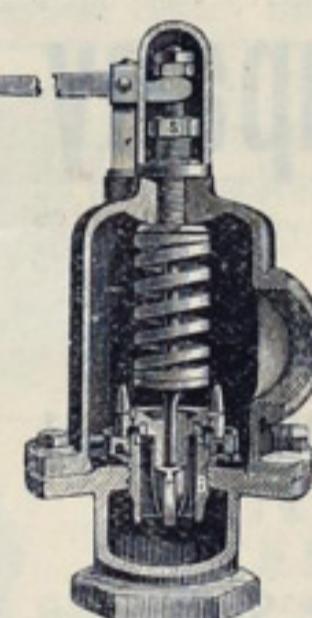
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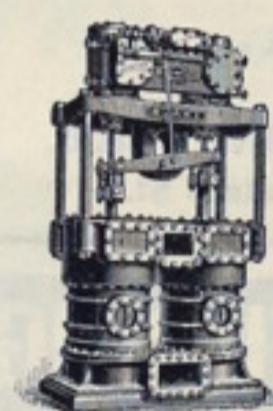
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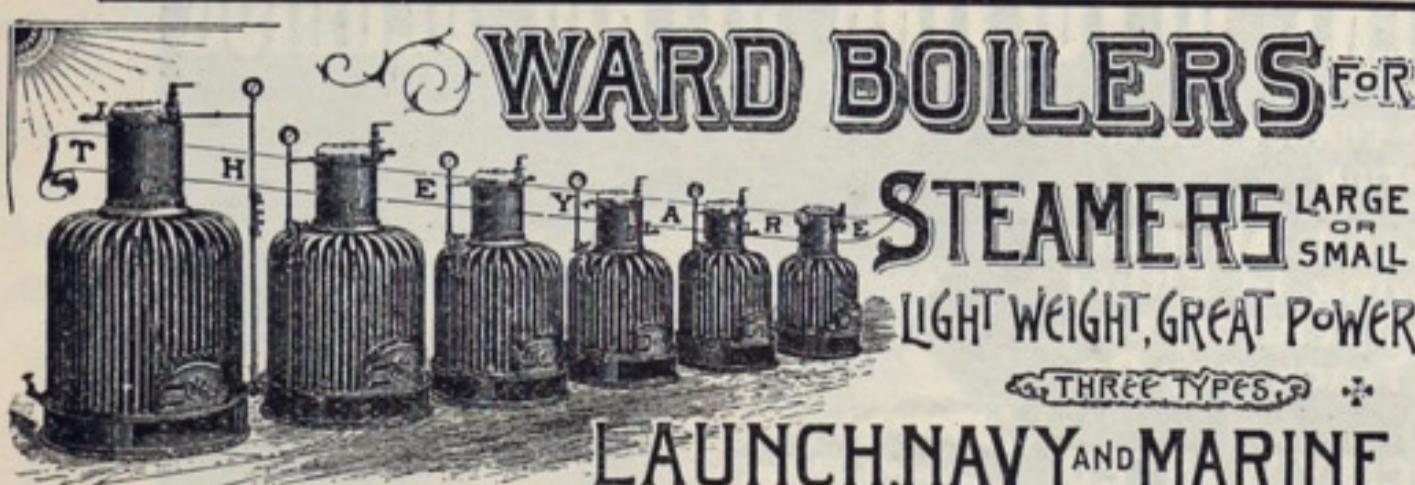
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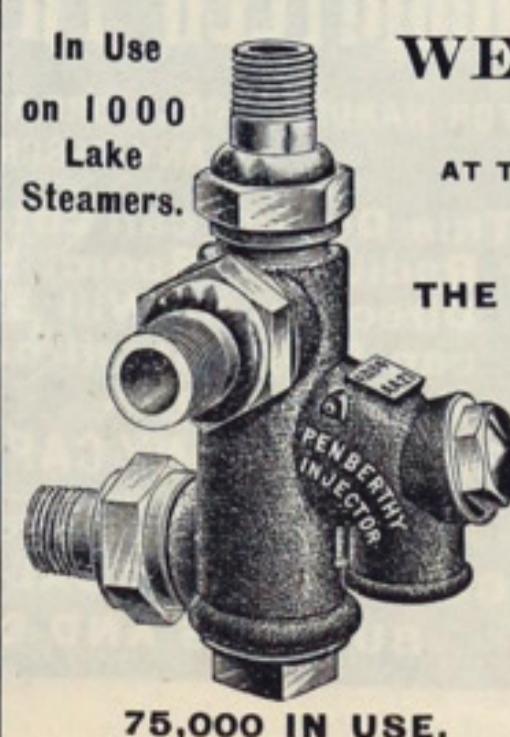
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